selectively growing, on said substrate, a first nitride semiconductor layer from said plural seed crystals under a first growth ambient pressure; and

growing, on said first nitride semiconductor layer, a second nitride semiconductor layer under a second growth ambient pressure different from said first growth ambient pressure.

REMARKS

At the outset, the Examiner is thanked for the review and consideration of the present application.

The Examiner's Office Action, dated August 1, 2001, has been received and its contents reviewed. Claims 1-12 are pending in the present application, of which claims 1 and 8 are independent. By this Amendment, claims 1 and 8 have been amended.

Turning now to the Office Action, claim 1-12 are rejected under 35 U.S.C. § 102(b) as anticipated by Porowski et al. (U.S. Patent 5,637,531 - hereafter Porowski). This rejection is respectfully traversed at least for the reasons provided below.

With respect to amended claim 1, a novel feature of the amended claim 1 of the present invention resides in a method of fabricating a nitride semiconductor device by a vapor deposition, wherein the method comprises plural steps of respectively growing plural nitride semiconductor layers on a substrate; and between a step of growing one nitride semiconductor layer and a step of growing another nitride semiconductor layer adjacent to said one nitride semiconductor layer among the plural steps, a step of changing a growth ambient pressure from a first growth ambient pressure to a second growth ambient pressure different from said first growth ambient pressure.

Accordingly, by utilizing the fabrication of the nitride semiconductor device by vapor deposition method of amended claim 1, the most appropriate growth ambient pressure can be set with respect to each composition of the deposited plural nitride semiconductor layers; hence, the quality of the semiconductor crystal of each semiconductor layer can be improved.

Turning to the cited reference, Porowski teaches a method of growing crystal by melting metals composing a group III element (Ga, Al, In) in a crucible, and in a nitrogen ambient where a state of equilibrium exists between vapor and solid.

According to Porowski, the group III raw materials are melted in the crucible to a liquid state, which is different from the vaporization of the group III raw materials (for example, organic metals such as nitride) on the substrate as in accordance with the amended claim 1.

Moreover, the abstract of Porowski also teaches that both nitrogen pressure and temperature applied for growing a second crystal layer are decreased as compared to those applied for growing a first crystal layer. Hence, the vaporization of the melted metals is prevented.

However, since amended claim 1 recites a vapor deposition method, in the case where the growing nitride semiconductor layer is an active layer including In, and where temperature is decreased, growth ambient pressure is increased to prevent the vaporization of In from the growth interface. This advantage is further detailed in, e.g., page 16, line 23 to page 17, line 22 of the present specification.

Applicants respectfully submit that Porowski completely fails to teach, disclose or suggest the vapor deposition method recited in amended claim 1. Therefore, the §102(b) rejection of independent claim 1 and its dependent claims 2-7 over Porowski is insupportable.

With respect to the amended claim 8, a novel feature of the amended claim 8 of the present invention resides in a method of fabricating a nitride semiconductor device by vapor deposition method comprising the steps of forming plural seed crystals on a substrate; selectively growing, on said substrate, a first nitride semiconductor layer from said plural seed crystals under a first growth ambient pressure; and growing, on said first nitride semiconductor layer, a second nitride semiconductor layer under a second growth ambient pressure different from said first growth ambient pressure.

Since Porowski neither teaches, discloses nor suggests the vapor deposition method, as discussed above, and the step of forming plural seed crystals on a substrate, amended claim 8 is distinguishable over Porowski. Accordingly, Applicants respectfully request reconsideration withdrawal of the §102(b) rejection of independent claim 8 and its dependent claims 9-12.

CONCLUSION

Having responded to all rejections set forth in the outstanding non-Final Office Action, it is submitted that claims 1-12 are now in condition for allowance. An early and favorable Notice

of Allowance is respectfully solicited. In the event that the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, the Examiner is courteously requested to contact Applicants' undersigned representative.

Respectfully submitted,

By _____

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Amended) A method of fabricating a nitride semiconductor device by a vapor deposition method comprising:

plural steps of respectively growing plural nitride semiconductor layers on a substrate; and

between a step of growing one nitride semiconductor layer and a step of growing another nitride semiconductor layer adjacent to said one nitride semiconductor layer among the plural steps, a step of changing a growth ambient pressure from a first growth ambient pressure to a second growth ambient pressure different from said first growth ambient pressure.

8. (Amended) A method of fabricating a nitride semiconductor device by a vapor deposition method comprising the steps of:

forming plural seed crystals on a substrate;

selectively growing, on said substrate, a first nitride semiconductor layer from said plural seed crystals under a first growth ambient pressure; and

growing, on said first nitride semiconductor layer, a second nitride semiconductor layer under a second growth ambient pressure different from said first growth ambient pressure.